THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 25. JULY 5, 1947 VOL. 59.

Isolation of Pleuropneumonia-like Organisms from the Bovine Genital Tract

By

D. G. ff. EDWARD, M.D., J. L. HANCOCK, B.V.SC., M.R.C.V.S.

AND S. L. HIGNETT, B.SC., M.R.C.V.S.

THE WELLCOME VETERINARY RESEARCH STATION, FRANT, SUSSEX

The finding of pleuropneumonia-like organisms in the human genital tract has recently aroused interest. They have been isolated from a number of cases of non-specific (non-gonococcal) urethritis in the male and from about 20 per cent. of females. In the female they were often associated with evidence of infection and sometimes accompanied the gonococcus. They were also found in apparently normal women. Reports have come from America (Dienes & Smith, 1942), Australia (Beveridge, 1943; Beveridge, Campbell & Lind, 1946) and from this country (Klieneberger-Nobel, 1945; Salaman *et al.*, 1946) and similar results were obtained in a series examined by one of us (D. G. ff. E.). These findings suggested a search for this group of organisms in the bovine genital tract, where infertility of an apparently infective nature which cannot be ascribed to any recognized pathogen is common. In this preliminary communication the results of examining the uterine discharges from 64 cows and heifers and material from seven bulls are reported. Pleuropneumonia-like organisms were isolated from 18 cows and from six bulls.

TECHNICAL METHODS

Mucus was collected into a sterile bottle from the anterior vagina either using a "Coldlite" vaginal speculum or by aspiration, using pipettes similar to those designed by Pierce (1947). In bulls, either semen or material obtained by massage of the seminal vesicles was examined. Directly the specimens were brought back to the laboratory special selective media were inoculated. The base for the media was ox heart infusion broth containing 1 per cent. peptone; 2 per cent. agar was added for the solid medium. Plates were poured after adding 20 per cent. horse serum, 10 per cent. fresh yeast extract and 1:8,000 thallium acetate, and after adjusting to *p*H 8·0. A semi-solid medium was also used with the same constitution, except that it contained 0·3 per cent. agar and a higher concentration (1:2,000) of thallium acetate. Just before use about 100 units of penicillin per ml. were added to the semi-solid medium, and two drops of a solution of penicillin containing 1,000 units per ml. were spread over half a plate and allowed to dry. For subcultures the media were used without penicillin. These selective media have been described more fully elsewhere (Edward, 1947a). The vaginal mucus was teased into suitably sized portions, which were used to inoculate heavily both a plate and a sloppy agar. Films were made from the mucus and stained by Gram's and Giemsa's methods, and by neutralized polychrome methylene blue after previous treatment with warm acid (Edward, 1947b).

After incubation at 37° C. for three to four days in a closed container to prevent loss of moisture, plates were examined under a dissecting microscope for the characteristic colonies of the pleuropneumonia group. Subcultures on to solid medium were made from single colonies using a pasteur pipette drawn out to a fine point. For subsequent subcultures a piece of the medium bearing surface growth was cut out, inverted over the surface of another plate and streaked across it. Sloppy agar tubes were incubated for a week before discarding them as negative. If any suspicion of growth developed, 0·5 ml. was subcultured in another sloppy agar. Growth of pleuropneumonia-like organisms was established by examining Giemsa-stained films, by dark ground examination and by subculture on a plate.

RESULTS

Observations were begun in a large herd of attested Friesian cattle including four bulls. This was a very high yielding herd in which for a number of years fertility had been low. There had been a small incidence of abortion occurring at various stages of pregnancy, not due to brucellosis. There had been repeated unsuccessful efforts to ascertain the cause of the breeding difficulties. *C. pyogenes* had been isolated from the semen of three of the bulls and from a few vaginal samples. A high proportion of the cows had cervicitis and adhesions in the ovarian bursae. At the first examination of three vaginal samples for pleuropneumonia-like organisms one plate yielded a moderate number of colonies with appearances characteristic of the group. The corresponding sloppy agar was also positive. Attempted subcultivation failed. The sample was from an infertile heifer, clinically normal except for adhesions of the ovarian bursae. When this animal was examined one month and again six months later, cultures were negative. At a later date vaginal samples from six other animals in this herd were examined; one sample gave a positive growth in the sloppy agar, but not on the plate. Attempts to subculture this strain also failed. Cultures taken five months later from the same animal were negative. In view of subsequent successful results it is difficult to understand the failure to subculture these first two strains of pleuropneumonia-like organisms. It was noticed that colonies of the first strain appeared only under lumps of mucus and it seemed possible that the media might be deficient in certain growth factors. The same media, however, were at that time being successfully used to isolate pleuropneumonia-like organisms from the human genital tract and to maintain stock cultures. At a further examination of five cows from this herd another positive culture was obtained; again the sloppy agar only was positive. This strain was easily subcultured and has now been maintained for 15 subcultures. Altogether 14 cows were examined from this herd and three found to be carrying pleuropneumonia-like organisms in their genital tract.

Since these isolations of pleuropneumonia-like organisms were from a herd with low breeding efficiency, a small herd of attested Guernsey cattle also with a low level of fertility was chosen for more detailed observations. Reduced breeding efficiency had been experienced over a number of years but the problem became acute in the winter, 1945-46, after there had been a number of cases of contagious abortion, and has persisted. Detailed clinical examination carried out over a period of six months established failure of ovulation in several animals and suggested that their infertility was physiological in origin. In addition a number of animals exhibited manifestations of inflammation of the genital tract, such as cervicitis, bursitis, and rarely salpingitis. In isolated cases there was a scanty purulent vaginal discharge after service. The ordinary bacteriological examination of the semen of both stock bulls and of the vaginal material from a number of cows failed to reveal any organisms of significance. Judged by the criteria of initial motility, density, morphology and viability in egg phosphate buffer both bulls were of normal fertility. Vaginal samples from 17 cows and heifers out of a total of 28 animals in the herd were examined for pleuropneumonia-like organisms. Twelve were found positive; most gave a profuse growth. The semen of both bulls collected by artificial vagina was also positive.

In addition, material from 30 cows and five bulls from various other farms have been examined for pleuropneumonia-like organisms. Most of the cows had a history of infertility. Specimens from three cows and four bulls gave positive cultures. The three cows had profuse muco-purulent discharges, from which cultures on the ordinary media gave few bacterial colonies and none of pathogenic significance. Films from the discharge of one animal showed large numbers of pus cells, but no bacteria. Vaginal material from three maiden heifers gave no growth.

DESCRIPTION OF THE ORGANISMS

Colonies appeared on plates after two or three days' incubation; they were always small but differed greatly in size from culture to culture and even in the same culture. Isolated colonies sometimes reached a diameter of about 1 mm. after four days' incubation, but often the colonies were very much smaller. They were best observed with a dissecting microscope using slightly oblique transmitted light. The most characteristic feature of a colony was a dark central spot due to growth into the substance of the medium. If the surface growth was removed with a loop the dark spot was left. The rest of the colony was almost translucent and had a finely reticulated surface. The colonies were circular with a regular edge and a smooth surface. Commonly the surface had a central depression, though sometimes the top was flat or even umbonate. Impression films made from the surface of a culture and stained by Giemsa's method, showed characteristic granules and globoid bodies (Dienes, 1945); ordinary bacterial forms were absent in Gram films.

Growth in sloppy agar occurred either as an almost uniform opacity when growth was profuse, or as separate colonies, sometimes quite large, such as were described by Beveridge (1943) for the human organisms. The typical forms of the pleuropneumonia group, including granules, rings and branching threads, were seen by dark ground examination or in Giemsa stained films.

Discussion

The organism of contagious bovine pleuropneumonia was isolated in 1898, but only within the last few years have investigations shown the existence of a large group of related organisms with the same general properties. Such organisms have been isolated from rats, mice, dogs and man, from fertile eggs and from sewage and decaying vegetable matter. They were sometimes the cause of naturally occurring disease, such as arthritis in rats (Findlay, MacKenzie, MacCallum & Klieneberger, 1939) and infectious catarrh in mice (Edward, 1947b); sometimes their pathogenic role was more doubtful, as in the human genital tract. Other strains appeared to be commensals, although capable of producing disease when injected parenterally (Sabin & Johnson, 1940). The organisms in sewage were saprophytes (Laidlaw & Elford, 1936). So far agreement on nomenclature for the group has not been reached. They are usually referred to as pleuropneumonia-like organisms and it is of interest that the bovine, the host for the first member of the group isolated, has now been shown to harbour another member.

All the cows found to be carrying pleuropneumonia-like organisms came from herds with long histories of infertility which could not be ascribed to any known cause. With the exception of *C. pyogenes* isolated from one herd, pathogenic organisms had not been found. The number of bulls examined for pleuropneumonia-like organisms was few, but the proportion giving at least one positive isolation was high. One bull from whom the organism was isolated had a seminal vesiculitis, while the other animals showed no gross abnormality.

It is not yet possible to assess the pathogenic significance of the organisms in the bovine genital tract. Though the findings suggest a possible association with infertility and infection of the genital tract, conclusions should be drawn with caution, bearing in mind the position in the human. Although these organisms have only been isolated from men with urethral discharges they have been recovered from apparently healthy women and no conclusion has yet been drawn regarding their pathogenicity in man. To determine the significance of the bovine organisms it will be necessary to investigate a much larger series of animals, particularly bulls, drawn from a number of herds. The investigation must include many healthy animals from herds with good breeding records. It will also be necessary to carry out serological and pathogenicity tests, although these are made technically difficult by the peculiar properties of the organisms.

The selective media proved satisfactory for the isolation of pleuropneumonia-like organisms in pure culture from material obviously heavily contaminated with bacteria. Cultures from only one sample, a semen heavily contaminated with *Pseudomonas pyocyaneus*, were overgrown with bacteria. Sloppy agar gave a higher proportion of positive isolations, but plates had the advantage that colonies of pleuropneumonia-like organisms were immediately recognizable by their typical appearance. Identification of the organism was made by its colonial appearance and its morphology under dark ground examination. These are characteristic, and with slight variations, common to all members of the group. The colonies of the bovine strains were not distinguishable from human strains. No intra-cellular inclusions were seen in stained films made from vaginal discharges containing pleuropneumonia-like organisms.

Summary

As a preliminary finding, the isolation of organisms of the pleuropneumonia group from the vaginal material from 18 cows out of 64 examined is reported. Infected cows came from herds with long histories of breeding difficulties and showed evidence of inflammatory changes. Similar organisms were isolated from the semen of six bulls.

The significance of these findings and the possible pathogenic role of the organisms as a cause of infertility in cattle are discussed.

References

Beveridge, W. I. B. (1943.) *Med. J. Austr.* **2.** 479.
———, Campbell, A. D., & Lind, P. E. (1946.) *Ibid.* **1.** 179.
Dienes, L. (1945.) *J. Bact.* **50.** 441.
——— & Smith, W. E. (1942.) *Proc. Soc. exp. Biol.* **50.** 99.
Edward, D. G. ff. (1947*a*.) *J. gen. Microbiol.* **1.** 238.
———. (1947*b*.) *J. Path. Bact.* **59.** 209.
Findlay, G. M., Mackenzie, R. D., MacCallum, F. O., & Klieneberger, E. (1939.) *Lancet.* **2.** 7.
Klieneberger-Nobel, E. (1945.) *Ibid.* **2.** 46.
Laidlaw, P. P., & Elford, W. J. (1936.) *Proc. roy. Soc.* Series B. **120.** 292.
Pierce, A. E. (1947.) Private communication.
Sabin, A. B., & Johnson, B. (1940.) *Proc. Soc. exp. Biol.* **44.** 569.
Salaman, M. G., & collaborators. (1946.) *J. Path. Bact.* **58.** 31.

Treatment of "Fly Disease" of Cattle and Dogs*

By

R. N. T.-W.-Fiennes

Mr. Fiennes, in opening this discussion, said that it was not yet possible to advise with certainty on the best course of treatment for trypanosomiasis in cattle.

There were two Phenanthridinium compounds in use, S.897 and S.1553. Whereas in the East African territories S.897 had found greater favour, in Northern Rhodesia and South Africa S.1553 had been used with a great deal of success. S.897, otherwise known as Phenidinum, is given intramuscularly or intravenously at a dosage rate of 2 mg. per kg. of body weight. It is highly trypanocidal and also curative, patients recovering condition very quickly after its use. Disadvantages are that it is only soluble 1 per cent. in water and therefore a large dose must be given, usually between 40 and 60 c.c. Given subcutaneously it is liable to cause large and painful swellings, which may be followed by sloughing of the skin; even given intramuscularly there is often lameness and sometimes oedema of the scrotal region; if the animal is destroyed after intramuscular injection, the muscles have in many cases suffered severe damage and are not fit for human consumption.

S.1553, or Dimidium bromide, is also highly trypanocidal, but East African reports indicate that recovery of condition following its use is often much delayed. Apart from this, there are disturbing reports of photosensitization, attended by heavy losses, following its use in therapeutic doses, in parts of Uganda. The areas in which this has occurred have been localized, indicating that there is probably some extrinsic factor, possibly a legume in the pasture, but one is somewhat alarmed at the prospect of its widespread introduction in place of S.897 for fear of these consequences.

Earlier samples of S.1553 caused in many cases alarming swellings when given subcutaneously or intramuscularly, and for this reason it had not been adopted for general use in Kenya. Manufacturers, however, claimed that this defect had been overcome and newer samples of the drug were under test. In a preliminary trial on ten cattle, a dose of 2 mg. per kg. had been given subcutaneously. There had been no swellings and the drug appeared to have effected cure.

Some workers claimed that a dose of 1·0 to 1·5 mg. per kg. of this drug was sufficient and a dose of 1·0 mg. was standard in South Africa, where very large quantities were being used. In addition, the drug could be readily used in a 3 per cent. or even 4 per cent. solution. This meant that doses of the solution as low as 5 c.c. to 15 c.c. could be given and if satisfactory for subcutaneous injection, would in this way be very handy for use in the field and for non-professional persons.

Manufacturers wished to discontinue production of S.897 because of the reduplication of plant for manufacture. In view of this, replicated experiments on a large scale were being carried out in Kenya, Uganda, Tanganyika and Northern Rhodesia to ascertain whether the newer samples of S.1553 would satisfy local requirements. Until the results of these became known, more could not be said about the matter, but users could be assured that the department would continue to press for S.897 unless the reports on S.1553 were fully satisfactory.

The second drug commonly used in treatment of trypanosomiasis in cattle was Stibophen, an antimonial supposed to be the same as the older Bayer preparation Antimosan. Some people claimed that this was less effective than Antimosan, but the speaker, though he had not carried out comparative tests, had been unable to find evidence of this on examination of a large number of records, kept by a certain complainant. One tablet of Stibophen is dissolved in 40 c.c. of water and this is a single dose for cattle of average size. Four to five injections are given subcutaneously at weekly intervals. It is very effective against trypanosome infections in cattle, but is expensive as compared with Phenanthridinium, the relative costs of dosage being about Cts. 30 and Shs. 1/50 respectively. This and the necessity of repeat dosage would normally preclude the use of Stibophen for herd treatment in native areas.

There are certain drawbacks to the use of Phenanthridinium which should be mentioned. Randall & Laws, in some very illuminating work carried out in Uganda not yet published, find it is not very effective in early cases of trypanosome infection and that a large number of relapses occur. In well-established cases it is, however, very effective. Browning & Calver found it to be less

* Summary of communication to the Kenya Veterinary Medical Association (Division, N.V.M.A.) Annual General Meeting, Kabete, February 22nd, 1947.

effective against certain strains of the parasite in mice than against others. Preliminary work at Kabete appears to indicate that the same holds true with cattle. Apart from this, after relapse, the trypanosome is somewhat resistant to repeat dosage, probably due to drug fastness. These are serious drawbacks to its use under field conditions, since relapses may occur from early cases or because the strain of infecting parasite is a resistant one. Herds that have been treated should therefore be watched for relapse cases and these should either be destroyed or treated with Stibophen, according to the value of the animal. Because of the fear of relapses, the speaker did not himself favour the low rates of dosage now being advocated for S.1553.

Treatment of cattle infected with *T. congolense* was reasonably satisfactory and in the majority of cases a complete cure could be effected. Treatment of *T. vivax* cases was rather a different matter. Experimental work was very difficult because the trypanosome was normally benign in character and the investigator never knew whether an apparent cure had been effected by his drugs or had occurred in the natural course of events. Examinations of some very reliable records on a European farm in a tsetse infested area indicated that both Stibophen and Phenanthridinium were of value against this parasite. During 1946, experimental work had been carried out, using a very virulent strain of the parasite, which normally killed cattle in 15 to 20 days. Three drugs had been used—Bayer 7602, supplied free of charge by Imperial Chemical (Pharmaceuticals) Ltd., under the label of M.3024, S.897, and Stibophen. Kubes, in Venezuela, had reported successful results from the use of Bayer 7602 against South American *T. vivax*. At Kabete, the drug had no influence on the acute stages of the disease. Both S.897 and Stibophen had saved the lives of cattle in the acute stage, but had proved non-curative. All cattle had relapsed some weeks later, but the disease had thereafter proved benign instead of virulent and full cure had taken place, as indicated by red cell counts, seven to eight months later. In these tests, S.897 had proved definitely superior to Stibophen. Two cattle out of seven treated with Stibophen had died during the week following treatment and one had relapsed severely and had been saved by S.897. Out of seven cattle treated with Phenanthridinium only one had failed to make a full recovery.

In the opinion of the speaker, therefore, Phenanthridinium was the drug of choice for use in *T. vivax* cases.

In conclusion, Mr. Fiennes said that he wished to refer to one case of treatment of *T. congolense* disease in a bull terrier. The dog had been treated in Mombasa with Stibophen, but had relapsed and when examined by him trypanosomes were swarming. He had given a single subcutaneous injection of the new S.1553 sample—4 c.c. of a 2 per cent. solution. The dog had made a spectacular recovery and had suffered no ill-effects from the injection. *T. congolense*, though not so rapidly fatal for dogs as *T. brucei*, was notoriously difficult of treatment in dogs and he was encouraged by the results obtained. He suggested that trials of Phenanthridinium should be made in dogs and would be glad if information concerning the results could be sent him.

Discussion

Mr. Hassan (Assistant Veterinary Officer, Mombasa) stated that in his experience Phenanthridinium was less satisfactory in *T. vivax* cases than Stibophen. Often you could tell these cases in a herd from those infected by *T. congolense* by a tendency to haemorrhage from the nose and ears. Such cases did not respond to Phenanthridinium, but Stibophen was very effective.

Mr. Hudson suggested that Mr. Fiennes' results on a very acute strain of the parasite might not be referable to the ordinary chronic cases, such as are normally encountered by officers in field work. He did not necessarily consider that the case for Phenanthridinium against Stibophen was proved.

Mr. Fiennes agreed that this was so. He considered that no drug had been produced that was fully effective against *T. vivax*. Both Stibophen and Phenanthridinium were effective against blood forms of the parasite, but in his work on *T. vivax* he was finding intracellular stages of the parasite, which he offered to demonstrate to those interested. He believed these to be schizonts and that they were resistant to drug therapy. He thought that Bayer 7602 might be effective against them and was preparing to test this experimentally.

The President (Dr. H. S. Purchase), in closing the discussion, said that he had been concerned to hear that manufacture of S.897 might be discontinued. He had great faith in the drug, which was very effective. He was, however, somewhat reassured by what Mr. Fiennes had said concerning S.1553.

Weekly Wisdom

"Happily the modern changes in the countryside, some good, some bad, have not destroyed its fundamental good features. Perhaps most important of all, the sense of responsibility to the land, the livestock and the community remains; fortunately indeed for us, for it has meant that the output per man-year has increased since 1939 *by some* 17 *per cent., and throughout all that critical period there was no threat of action by the workers against the community. No other primary producers can show such a record; if they could, the nation would not be in its present predicament."* —Review by E. John Russell of Richard Jefferies' "Hodge and His Masters." *Nature*, May 3rd, 1947. **159.** 588.

Rinderpest Virus Attenuated in Eggs*

By

J. R. HUDSON

Mr. Hudson outlined experimental work carried out by a combined group of Canadian and American workers during the war, which had led to the development of a strain of virus attenuated by passage in the yolk sac of the developing hen's egg (*vide Amer. J. vet. Res.* **7.** 23, pt. 2). The work was done in Grosse Island in the St. Lawrence River.

Experiments were made with various strains of virus, some of which were more readily adapted to growth on the chorio-allantois of the egg than others. Similarly, after a varying number of passages on the membrane, some were more readily adapted to the yolk-sac than others. It was not possible to adapt a wild strain direct to yolk-sac passage. Passage on the chorio-allantois caused little attenuation, but after a varying number of passages in the yolk-sac, the virus produced mild reactions in cattle. Eventually, after about 120 passages, the virus failed to infect cattle or to immunize.

Two workers from Grosse Island brought the virus to East Africa and a number of laboratory and field experiments were made in both Kenya and Uganda. The virus proved more attenuated than K.A.G. virus and provoked nothing more than a thermal reaction in highly susceptible cattle. A percentage of cattle failed to react to the virus and remained susceptible to bovine virus. This is analogous to what happens with goat virus, which may fail to produce a reaction in an animal with a low-grade immunity. However, animals which fail to react to goat virus and react to bovine virus, rarely die. The virus was unlikely to replace K.A.G. virus for the routine inoculation of Zebu cattle; but would probably prove very valuable for the immunization of Ankole cattle in western Uganda and high-grade stock in all the East African territories.

Virus produced by the method employed by the Joint Commission was not suitable for use in East Africa owing to its poor keeping properties. The position might be altered if supplies of dry ice became available. Another disadvantage was in the necessity for keeping several lines of virus at different stages of attenuation all going in eggs at the same time. This meant that considerable staff would have to be devoted entirely to the work.

The original strain of virus has been lost, but a beginning has been made with the adaptation of the ordinary Kabete virus to the chorio-allantois. There is no doubt that a virus attenuated by egg passage will prove of very great value in East Africa, but much research work still needs to be done to find a product which will keep better and which will immunize a larger percentage of inoculated animals without producing reactions any more severe than those produced by the Joint Commission's virus.

* Summary of communication to the Kenya Veterinary Medical Association (Division, N.V.M.A.) Annual General Meeting, Kabete, February 22nd, 1947.

Sentence of two months' imprisonment has been passed at the Belfast Police Court on Lewis Lascelles, convicted of selling pills in a public place contrary to the Medicines, Pharmacy and Poisons Act (Northern Ireland), 1945. Lascelles, it was stated, was seen by the police to be selling blood, stomach and liver pills at 2s. a box at a fair in Belfast. When asked by the police why he was offering pills for sale in a place other than a shop, he said, "I had taken a shop in Grafton Street, Dublin, but the authorities there would not let me open up as they said I was not a British subject. It is my only means of livelihood." He also told the police that he had to admit the offence and that he would not mind paying a regular fine. A police officer, on behalf of the Ministry of Home Affairs, said they were anxious to make an example of the case as Lascelles was a persistent offender. He asked that a term of imprisonment should be imposed.—*Pharm. J.*

* * * * *

Mr. R. Glave Saunders, M.R.C.V.S., secretary, Exeter branch of the R.S.P.C.A., states, in his recently issued annual report, that the winter's toll on Dartmoor was at least 45 ponies, 51 cattle, and 3,000 sheep.

THE VETERINARY RECORD

July 5th, 1947

THE N.F.U. AND N.V.M.A. IN LIVESTOCK DEVELOPMENT PLANS

A PROSPEROUS British agriculture, which can look to the future with confidence and is in a position to give full service to the nation, is the goal of the National Farmers' Union. With this aim in view, the Union is paying close attention to means of increased efficiency within the industry as well as to creating an environment in which farmers can reap the due reward of their efforts. The educational and scientific side of the work at Bedford Square is continually growing in scope and importance, a development which has been encouraged by the urgency of optimum food production in Britain during the years of stringent rationing, both in war and peace.

Farmers feel that the sympathetic attitude towards home agriculture of the Government, of all political parties, and of the nation as a whole, provides a firm foundation for long-term planning. The Agriculture Bill at least superficially appears to be designed to give legislative expression to this attitude. Whatever the real object of the Bill, Ministerial statements have stressed that for some years to come maximum economic production from our own soil will be needed to satisfy the demands of the public.

In this long-term programme is envisaged a progressive change of emphasis aimed at restoring, and enhancing, the place of livestock and livestock products in our agricultural economy. This is necessary both for good farming and as a means of saving foreign exchange. That it is better to import feeding-stuffs with which to produce milk, meat and eggs here in Britain rather than to pay out dollars lavishly on obtaining the finished products, is an obvious truth, but one which has been generally accepted only as a result of a persistent campaign by the N.F.U.

There is, indeed, immense scope not only for the expansion of the pig and poultry industries but of every branch of livestock husbandry. Even now we are at peace, all the essential livestock products—milk, meat, bacon, eggs, butter, cheese—continue to be rationed in Britain. Priority schemes for milk, it is true, have gone far to ensure the health of the younger generation, but there is a vast unsatisfied demand from adults for milk, and an adequate supply of milk can do more than any other single foodstuff to build up health and physique. Our herds of pigs, our flocks of sheep and poultry, were seriously depleted during the war years. And now, as a postscript to this melancholy tale of shortages, has come the effect of frosts, snow and floods, destroying 4,000,000 sheep and lambs, 30,000 cattle, and large numbers of pigs and poultry.

Truly, the expansion of livestock husbandry is a crying need in Britain to-day, both from the point of view of national economics and national health. We are sure that the N.F.U. would agree with us that animal health is the foundation of such an expansion, and that the veterinary profession must play an indispensable part in it. Indeed, the Union's view was put succinctly in its 1945 statement of long-term policy, "The Basis of Economic Security," which said : " The Union recognizes the predominant part that livestock plays in the agricultural industry and welcomes the measures introduced in recent years to effect livestock improvement, which must be maintained and accelerated. The Union would emphasize the need for increased educational facilities for veterinary training, a greater number of veterinary surgeons, more veterinary research and its more speedy application in practice. It is further appreciated that there is an important advisory service available to livestock farmers in the veterinary profession, including the whole-time officers of the Ministry of Agriculture and the individual veterinary practitioner. The improvement of livestock health and the control of the more serious and common diseases of stock are essential to maintain balanced farming on a sound basis and to ensure the production of food of animal origin of the highest nutritive quality."

There is already close liaison between the N.V.M.A. and the N.F.U. Diseases of Animals Committee. The continuing developments in animal husbandry, genetics and other branches of veterinary science can make collaboration between the two organizations one of the most fruitful sources of agricultural improvement. This collaboration must extend from Headquarters right through to the practising farmer and the practising veterinary surgeon. A greater realization by all concerned of the value of veterinary science not only in the cure but in the prevention of animal diseases would achieve remarkable results.

The Union has long agreed with our opinion that the right angle of approach to the whole problem of animal health is for the veterinary profession to deal with it from the herd aspect, and not from the aspect of the individual animal. The old idea of calling in professional aid as a last resort, and often too late for effective action, is dying : the emphasis is now on preventive, and collective measures. The " panel " scheme for dairy cattle, initiated as a result of the joint efforts of the N.V.M.A., the N.F.U. and the Ministry of Agriculture, was a pioneer step in this direction and has received just and generous praise from the latter two bodies, both of whom emphasize the pressing need for the continuation of, and increased application of, a scheme amended in the light of the notable advances in veterinary science of the last few years, and the need for greater elasticity in the therapeutic recommendations made.

The great advances made in veterinary research during the last few years have, we know, been as great a source of gratification to the Union as to the veterinary profession. The co-operation of both parties in getting the fruits of this research on to the farms, without the time lag which has so often been apparent, can lead, as no other move can lead, to an all-round improvement in animal husbandry, with consequent untold benefit to our supplies of urgently needed livestock products.

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

		Price net s. d.	*Post free* s. d.
Statutory Rules and Orders, 1947:			
1119.	Hill Cattle (Northern Ireland) Scheme. June 5th	0 2	0 3
1120.	Hill Cattle Subsidy Payment (Northern Ireland) Order. June 5th	0 1	0 2
1134.	Fluorine in Food Order. June 10th ...	0 1	0 2
1175.	Diseases of Animals (Boiling of Animal Foodstuffs) Order. May 2nd	0 1	0 2
1176.	Fowl Pest (Amendment) Order of 1947 (No. 2). May 8th	0 1	0 2
Agriculture, Ministry of:			
Leaflet, Advisory, No. 327.	Colds or Contagious Catarrh in Poultry ... ... Each	0 1	0 2
	Dozen	0 9	0 11

CLINICAL COMMUNICATION

An Unforeseen Danger of Lightning

By

D. R. ALLEN, M.R.C.V.S.

Veterinary Investigation Department, Ministry of Agriculture and Fisheries, University College, Cathays Park, Cardiff

In January last I was asked by Mr. D. R. T. Davies, M.R.C.V.S., Pontypridd, Glamorgan, to visit with him a farm from which he had just received a message that a cow had dropped dead and that 16 others had "gone mad." The cows had been brought into the cowshed for the afternoon milking and were perfectly normal. Suddenly one of the cows fell to the ground dead and the remainder started bellowing and kicking, jumping up in the air and then falling to the floor and trembling and stretching their legs as in a state of tetanus. The symptoms continued only for a few seconds but the cows remained extremely restless afterwards.

Not having seen the animals, Mr. Davies made a tentative diagnosis of electric shock and advised the cowman to switch off all electric lighting and to put on rubber boots and loosen the cows and let them out.

When Mr. Davies and I reached the farm all the cows were in a field and apparently were quite normal. They were again brought in for milking and inspection. This was approximately an hour after the shock had occurred. During this time an electrician had been called in and had discovered a fault in some temporary electric wiring in the barn. In order to prevent any possible recurrence the electric wires from the house to the cowshed, etc., were cut at a point A in the diagram. By so doing there was no possibility of any further shock from this source as there was no other electric power supplied to the buildings. It seemed quite reasonable to conclude that as there was a fault in the wiring, and as all the walls, the cows and the floors were wet, the electric current had "shorted" down the moisture on the wall on to the metal water pipes feeding the water-bowls, and then into the chains which were attached to the tubular steel partitions on which the water-bowls were fastened. The current in the chains which were around the moist necks of the cows would readily find its way to earth through each cow's four feet.

Having reached this conclusion, Mr. Davies and I left the farm at about 6.30 p.m., but within a minute of our leaving there was a lightning flash and two men who were milking rushed out of the building to tell the farmer who was in the yard that the cows had again "gone mad" and that four more of them had dropped dead. The cow which died in the first incident was in stall No. 1; the four which died with the second shock were in stalls 4, 8, 10 and 16. The cows which had again "gone mad" exhibited similar signs as before and settled down again within a few minutes and became normal except for being somewhat restless. It was not until the following morning that I learned about the second incident and I was then asked to carry out *post-mortem* examinations.

The findings were similar in all five cases except in the extent and the position of the lesions. There were no external lesions such as singeing of the hair where the chains had made contact; this, however, may have been prevented by the hair being wet when the electrocution occurred. Internally, the only lesions were those of subcutaneous bruising and small haemorrhages in the neck and head region. The cows whose chains were attached to the stall partitions on their right showed the bruising lesions mainly on the left sides of their necks and vice versa—*i.e.*, the regions where the chains made closest contact with the skin.

When it became known that the second incident occurred simultaneously with a flash of lightning, enquiries were made with regard to any lightning earlier during the day, as this had not been brought to our notice previously. It was then found that there had been lightning storms recorded continuously from 7 a.m. that day by the Electric Power Co., also that there was lightning at the time of the death of the first cow. Tests were carried out by electricians for the possibility of the death of the first cow being due to "shorting" from the fault in the electric wiring but it was found that no current whatsoever escaped on to the water pipes supplying the bowls. It was therefore concluded that all the deaths and the strange symptoms exhibited by the cows must have been due to an electric shock caused by lightning.

To account for this it was necessary to study the lay-out of the farm buildings, etc. The farm is situated in an elevated position on a hill-side with no high objects such as trees in the immediate vicinity which might have acted as lightning conductors. The farmhouse is situated about twelve yards from the main farm buildings which are of stone and are on a somewhat lower plane. Electricity is supplied to the farm by overhead cables and these extend into the farm buildings. This extension was cut, as has been stated, at the point A after the death of the first cow. The Electric Power Co. have used the water main at the farm as the necessary "earth" for their supply.

The water supply consists of a small diameter pipe running underground. From this a pipe runs into the house (the pipe which forms the "earth" for the electricity). The main pipe carries on to the washing house where it runs up the inside wall to a water tank. From this tank an overhead pipe runs through the large shippon, through the barn and into the small shippon. All the water bowls are supplied by this pipe.

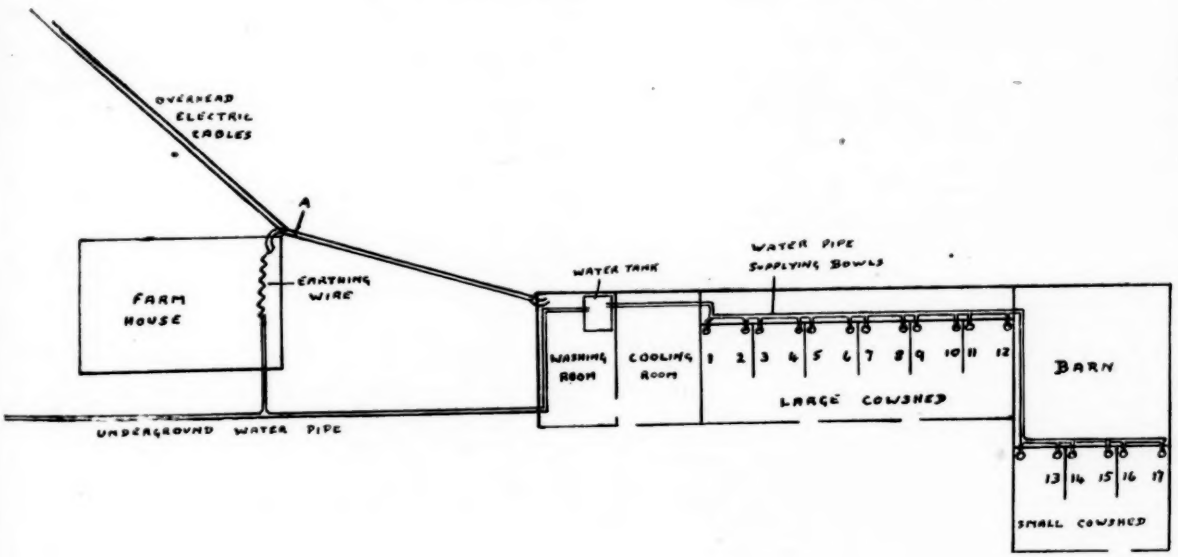

DIAGRAM OF FARM BUILDINGS, WATER SUPPLY & ELECTRIC CABLES

I consulted Professor R. T. Dunbar, Head of the Physics Department at this University with regard to this problem and he very kindly accompanied me to inspect the farm. I here quote his report:—

"There is no doubt at all that the cows were electrocuted and that the electrocution coincided with a stroke of lightning in each case.

The failure of the usual safeguards in this case is not easy to explain, but it is at least clear that a high voltage found its way on to the water system at the farm through the electric power lines which lead into the main building. Apparently the electric installation depends on the water pipes at the farm for its 'earth,' and in the circumstances this seems to me to be a dangerous arrangement because (1) there is such an extensive water pipe system above ground, and (2) only a single small diameter pipe is below ground.

What is not clear is the source of the voltage that was finally responsible for killing the cows. There are three possibilities:—

1. The lightning produced a surge in the low tension overhead cables which caused an arc over to earth, bringing the water pipe system up to some 200 volts.

2. The lightning produced a surge in the high tension overhead cables, resulting in a flash over in the step-down transformer, bringing the earth wire (and therefore the water pipe system) up to thousands of volts.

3. The surge initiated by the lightning induced local oscillations of high amplitude in the water pipe network, the power wires providing the coupling."

This case is interesting in that it emphasizes the necessity of a really efficient earthing system for all such electrical installations, particularly on farms and other buildings where similar losses could occur—and possibly even the loss of human life. In this instance the two milkers were wearing rubber boots and were thus afforded protection against the shock.

This is the only case within my knowledge where housed cattle have been killed in this manner by electrocution caused by lightning.

Since these losses occurred I would mention that a leading electrical engineer has been consulted by the farmer and the earthing system has been augmented by the installation of several "earthing pits" at the farm.

In conclusion, I wish to acknowledge the kind assistance and suggestions given by Professor Dunbar in investigating this case.

ABSTRACTS

[Studies on Brucellosis of Swine: III—Brucella Infection in the Boar; IV—Semen Quality in Brucella-infected Boars; V—Reproduction Studies with Naturally Infected Sows and Boars. Hutchins, L. M., & Andrews, F. N. (1946). *Amer. J. vet. Res.* **7**. 379-394. (19 refs.).]

III.—The authors confirmed that boars, even young unweaned animals, are highly susceptible, experimentally and naturally, to infection with *Br. suis*. This organism was present in the semen of six out of eight naturally infected boars, being isolated 63 times from 92 samples. Symptoms are often not apparent although orchitis and decreased sexual desire may be manifested. Of 25 clean gilts covered by infected boars, none became infected, suggesting that coitus may not be the principal means of spreading the disease.

IV.—Measurements of the semen of infected boars showed that it may be inferior to normal semen, but the normal figures for certain data were not available for comparison. This result is supported by the observations that infected boars are often sterile and that they tend to produce smaller litters in clean gilts.

V.—Eight naturally infected sows, bred to farrow twice yearly, farrowed only 14 litters in two years, out of a possible 32. The offspring did not, however, become infected. In some cases they showed a slight agglutinin titre when suckling. This disappeared one month after weaning and was attributed to antibodies received from the mothers.

The unilateral castration of two sterile infected boars was followed by a return of fertility, a general improvement in health and gradual loss of agglutinin titre.

A. W. G.

[Penicillin Therapy in Bovine Mastitis. Campbell, J. J., & Gallaher, M. A. (1947.) *Irish Vet. J.* (in press).

Following a very comprehensive review of the literature on the therapeutic value of penicillin in bovine mastitis the authors applied the drug in one herd heavily affected with chronic mastitis due to *Str. agalactiae*. All cows were treated, whether infected or not, in order to find out whether infection could be entirely eliminated. The dose of penicillin used was 100,000 units, injected either as a single infusion in 100 c.c. of distilled water or as two infusions daily of 50,000 units or four of 25,000 units. The results obtained in lactating cows may be tabulated as follows:—

			Infected with Str. agalactiae			*Infected with Staphylococci*		
Group	*Treatment*	*Total Cows*	*Cows*	*qtrs.*	*Cured qtrs.*	*Cows*	*qtrs.*	*Cured qtrs.*
1	1× 100,000 units	10	5	10	6 (60%)	4	7	4 (57%)
2	2× 50,000 units	9	6	8	8 (100%)	2	3	3 (100%)
3	4× 25,000 units	9	5	9	9 (100%)	4	4	2 (50%)

Thirty-four dry cows were also treated in the same way as the first two groups described above and the results showed that 85 per cent. of the infected cows calved free from infection after giving two infusions. The authors observed a rapid improvement in the character of the secretion but this was not always accompanied by a clinical improvement in the udder tissue.

The experiment further describes the continued treatment of refractory cases, but while claiming considerable success in improving the condition of a highly infected herd, the value of therapy as a means of eliminating infection from the herd was not fully explored.

S. J. E.

ROYAL COLLEGE OF VETERINARY SURGEONS

Annual General Meeting

The one hundred and fourth annual general meeting of the Royal College of Veterinary Surgeons was held at 10, Red Lion Square, London, W.C.1, on June 3rd, 1947, with the President, Mr. H. W. Dawes, M.R.C.V.S., in the chair.

There were also present: Professor G. F. Boddie, Mr. E. Brown, Mr. W. Brown, Professor T. G. Browne, Professor J. B. Buxton, Mr. R. E. Glover, Dr. Tom Hare, Capt. W. R. McKinna, Mr. G. P. Male, Major A. B. Mattinson, Professor W. C. Miller, Capt. T. M. Mitchell, Professor W. M. Mitchell, Capt. S. J. Motton, Capt. J. W. Procter, Major L. P. Pugh, Lt.-Col. P. J. Simpson, Mr. A. Spicer, Mr. H. W. Steele-Bodger, Capt. W. K. Townson, Mr. J. F. D. Tutt, Professor G. H. Wooldridge and Dr. W. R. Wooldridge.

The Secretary read the Notice convening the Meeting.

The Secretary read the minutes of the last annual general meeting, which were unanimously accepted.

The Secretary reported that apologies for absence had been received from Mr. Dolan and Professor Kearney, also from Dr. Share Jones. A letter had been received from Mr. Nairn, saying he would be unable to attend any meetings owing to the fact that he was in hospital for a serious operation. A letter had been received from Mr. Gould and a telegram from Colonel Rees-Mogg.

Professor Mitchell: May I make a statement with regard to Mr. Nairn. He went into hospital on Thursday, and was operated on on Friday, and had part of his stomach removed. I hear he is as well as can be expected.

The President: I am sure you would like a letter expressing our sympathy with Mr. Nairn to be sent from this annual general meeting of the Royal College. (Hear, hear.)

Council Election: Auditors' Report

The President: I will now ask the Secretary to read the Auditors' Report on the scrutiny of voting papers.

The Secretary read the Report.

The President: You have heard the Report from our auditors on the scrutiny of the voting papers. I therefore declare that the first eight names on that list be elected members of Council.

They are:—

Mitchell, T. M.
Wooldridge, G. H.
Procter, J. W.
Gould, G. M.
Steele-Bodger, H. W.
Buxton, J. B.
Sumner, H.
Share Jones, J. T.

The next business is to receive the Report of the Returning Officer of Eire.

The Secretary read the Report of the Returning Officer of Eire.

The President: You have heard the Report of the Returning Officer of Eire. I hereby declare Mr. Dolan a member of the Council.

Annual Report and Statement of Accounts

The President: The next item on the agenda is Item 6, the Annual Report. The Annual Report is in front of you and I think it would be better if I just took it through page by page and if there is any member who wishes to make a comment, perhaps he would raise it at the appropriate time.

Page one deals with the details of the last general meeting and commences with the records of the Examination and Education Committee. Page two continues with the examination results. You will see at the bottom of page two a list of prize awards.

Page three contains a note of proposed Veterinary Legislation and mentions the Centenary number of *The Veterinary Record* and gives an account of the presentation to members of Council. At the bottom of that page reference is made to the death of Dr. Bullock.

Page four deals with the appointment of the new Secretary and Registrar, an appreciation of Mr. Francis and his work, a note on the work of the Registration Committee, and at the bottom of that page, you will notice the Report of the work of the Parliamentary Committee.

Page five deals with the Report of the Finance and General Purposes Committee and the Library and Publication Committee.

We pass on then, gentlemen, to pages six and seven, eight and nine, ten, eleven and twelve, which deal with the statement of our accounts, the balance sheet, and income and expenditure account of the Royal College of Veterinary Surgeons, and following on that, various Trust Funds of the Royal College.

On page twelve you will see the Report of the Auditors, Messrs. Wilkinson, Chater & Co.

Is there any portion of that Report on which anybody wishes to comment?

It was proposed, seconded and agreed that the Report be adopted.

Professor Buxton: I should like to propose a hearty vote of thanks to the President for his excellent conduct in the chair.

Colonel Simpson: I should like to second that.

Carried unanimously.

The President: Thank you very much. I thank you for your attendance here and declare the meeting closed.

. . . . .

SPECIAL MEETING OF COUNCIL

Re-election of Mr. Howard W. Dawes as President

A Special Meeting of Council, R.C.V.S., was held at 10, Red Lion Square, London, W.C.1, on Thursday, June 5th, 1947, with Mr. H. W. Dawes (President) in the chair.

There were also present: Professor G. F. Boddie, Mr. Esmond Brown, Professor J. B. Buxton, Mr. R. E. Glover, Capt. W. R. McKinna, Mr. G. P. Male, Major A. B. Mattinson, Professor W. C. Miller, Professor W. M. Mitchell, Capt. S. J. Motton, Capt. J. W. Procter, Major L. P. Pugh, Professor J. Share Jones, Lt.-Col. P. J. Simpson, Mr. A. Spicer, Major H. Sumner, Capt. W. K. Townson, Mr. J. F. D. Tutt and Professor G. H. Wooldridge.

The minutes of the previous meeting, having been printed and circulated, were taken as read and signed as correct.

Election of President

On the proposition of Professor Share Jones, it was unanimously resolved: "That Mr. H. W. Dawes be re-elected President of the College for the ensuing year."

Mr. H. W. Dawes, from the chair, expressed his warm thanks for his re-election.

Other Officers

Vice-Presidents.—It was unanimously resolved that Major A. B. Mattinson and Mr. Spicer be elected Vice-Presidents for the ensuing year.

Treasurer.—Lt.-Col. P. J. Simpson was unanimously re-elected Treasurer of the College for the ensuing year.

Secretary and Registrar.—Mr. W. G. R. Oates was unanimously elected Secretary and Registrar of the College for the ensuing year.

The meeting then terminated.

MEETING OF COUNCIL, N.V.M.A.

Summary of Proceedings

Uppermost in the minds of members attending the meeting of Council held at the Connaught Rooms, W.C.2, on June 20th, with the President, Professor W. M. Mitchell in the chair, was the continued refusal of the Minister of Agriculture to accept the Association's view that the salary scales imposed upon the Ministry's Veterinary Officers are inequitable and harmful to the status, not only of the officers concerned but that of the whole profession.

Council was informed of the rejection by the Ministry of the Association's offer to insert free of charge in *The Veterinary Record* its advertisements for posts in this service, payment being deemed unacceptable inasmuch as the N.V.M.A. was going to recommend members of the profession not to apply for any posts advertised.

After a discussion, which in no way indicated any division of opinion in the Association on the main issue, Council approved the action taken in publishing in the Association's journal, without reference to the full Editorial Committee, but to its Chairman only, a series of editorials concerning the origin and significance of the controversy and stressing the necessity for united backing for the N.V.M.A. in its efforts to secure a satisfactory outcome. Its negotiators are to bear in mind the desirability of circulating to the full Committee any further editorials in the series. In full support of the Association a number of heartening strongly worded resolutions from Divisions was read. Of topical and significant interest was the entry into the fray of women members of the profession with a demand for "equal pay for equal work."

Early in the meeting, members were glad to learn of the steady progress towards recovery after his serious operation of Mr. W. Nairn, a former well-loved president, and of the attainment by the Association of a record membership of 3,117. Gratification was also felt at the application for affiliation, which readily was granted, from the Association of Veterinary Teachers and Research Workers.

Committee recommendations included the following, warmly endorsed by Council for forwarding to the Annual General Meeting:

That the officers of the Association for 1947-48 be:

President: Mr. L. Guy Anderson.

Senior Vice-president: Professor W. M. Mitchell.

President Elect: Dr. R. F. Montgomerie (subject to consent).

Hon. Treasurer: Mr. H. E. Bywater.

Hon. Secretary: Professor G. H. Wooldridge (subject to consent), Mr. T. L. Wright being unable to accept re-nomination for this office.

The Council heartily approved a unanimous recommendation that the "Dalrymple-Champneys" Cup and Medal for 1947 be awarded to Dr. E. L. Taylor.

The correspondence included a grateful acknowledgment of the £250 contributed by the Association to the Agricultural Disaster Fund, and an intimation from Sir Daniel Cabot that the Permanent Commission had accepted the offer that the International Veterinary Congress should be held in London in 1949. An Organization Committee is being formed, with Sir Daniel himself as President, Professor J. B. Buxton as Vice-president and with Mr. W. G. R. Oates, Secretary and Registrar of the Royal College of Veterinary Surgeons, as General Secretary. Six members of Council, N.V.M.A., have been appointed to serve on this Committee of the Congress.

The Parliamentary and Public Relations Committee recorded that, Council having approved of this course, it was proceeding to the appointment of a Public Relations Officer for the Association and that, with the endorsement of the Editorial Committee, editorials were being prepared for the *Record* on the value of modern publicity to the profession. A series of articles having as their motive the dissemination to the Press of accurate information on veterinary and allied matters, also is in process of preparation.

Through the good offices of the Parliamentary Agent some valuable amendments, designed to facilitate the utilization of veterinary personnel in the examination and seizure of unsound food, have been accepted by several Corporations promoting Bills.

The Overseas Services Committee is examining salary scales and conditions of service in many parts of the Colonial Empire and in many instances representations for their improvement have been or will be made to the authorities concerned.

Reference has been made above to some of the major activities of the General Purposes and Finance Committee. It should be added that an endeavour is being made to expedite review by the Ministry of the calfhood vaccination scheme; that it is left to the Editorial Committee to distribute for review in suitable quarters the various publications of the Association; and that the question of the appointment of an Assistant Editor was referred back to the Committee for consideration at its next meeting and report to Council. In view of the refusal of the Ministry of Supply to extend to veterinary surgeons the preferential treatment in the allocation of new motor cars now accorded to doctors and others, this matter is to be pressed further, through the Parliamentary and Scientific Committee and by circular letter to members of Parliament.

From the report of the Veterinary State Medicine Committee it was learned that, following consideration of this matter by the N.V.M.A.-N.F.U. Liaison Committee, the operation of the present scheme for the Control of the Major Diseases of Dairy Cattle is to continue for another year, subject to the approval of the Ministry of Agriculture, pending the formulation of a new scheme carrying greater advisory emphasis and, if possible, making provision for adequate diagnostic laboratory facilities as an essential part of the scheme. Acceptance by the Ministry of the Association's proposals for an increase in fees for part-time work was recorded.

The Organizing Committee, in association with the local Divisions concerned, is busily engaged in ascertaining the real need of districts where proposals are afoot to introduce free treatment schemes, and an interim report was received from the Sub-committee on Veterinary attendance on sick animals of the poor, etc. The replies to the questionnaire sent out to Divisions have given the Sub-committee a very good over-all picture of the position. The Divisions are to be asked for their views and suggestions on the statement, emanating from the Humane Treatment of Animals Sectional Committee of the National Council of Women for Great Britain, that an urgent need exists for the provision within the large towns of Regional Animal Hospitals with qualified resident and consultant veterinary staff; also for an ambulance service for small animals involved in street accidents.

In discussion of the report, reference was made to the number of institutions and individuals undertaking veterinary services at the expense, it was alleged, of the small-animal practitioner. Assurance was given that this aspect was very much on the minds of the Committee.

From the Technical Development Committee (and others) came the intimation that amongst the new Association publications shortly to be issued are (1) "The Husbandry and Diseases of Pigs," (2) "Laboratory aids to Clinical Diagnosis," (3) "Handbook on First Aid to Animals" and (4) "Guide to Veterinary Surgeons officiating at Small-Animal Shows." The Committee continues its efforts to promote the collection of accurate data on the incidence of disease, and has under discussion the subject of skin lesions and their relation to the tuberculin test.

Apart from the question of the salaries of the Veterinary Staff of the Ministry of Agriculture, reference to which introduces this summary, the Home Appointments Committee intimated that it is keeping in mind, in connection with the general salaries question, that of the pay of Officers of the R.A.V.C. and that appropriate further action will be taken when an opportunity presents itself. A memorandum on the position of veterinary assistants is being drafted for consideration by the committee.

The regrettable decision of Barry Council not to appoint a veterinary surgeon on public health duties on the retirement of the member of the profession who has carried them out for 36 years on a part-time basis, but to allow these duties to revert to a sanitary inspector, was to be raised in the House of Commons.

N.V.M.A. representatives on other bodies presented an interesting series of reports. That by Professor Wooldridge on the Victoria Veterinary Benevolent Fund, as its author indicated, made splendid reading inasmuch as the income for the year from subscriptions, largely owing to the work of the Ladies' Guild, showed a marked increase over 1945, and that the contributions from Societies had been very generous indeed. But more and more help is required if the Fund is to give the relief so badly needed by our less fortunate members and their widows and families.

The verbal report made by Dr. Wooldridge indicated once again how valuable is representation of the Association on the Parliamentary and Scientific Committee, in furtherance of the aims of the profession.

And so to Edinburgh, where, as the President indicated, social activities assuredly will take precedence over political issues.

IN PARLIAMENT

Colonial Development Corporation

A warm welcome was given in both Houses of Parliament last week to the announcement that the Government propose to establish a Colonial Development Corporation, with total borrowing powers of the order of £100,000,000, to establish or assist any enterprise in the Colonies which is designed to increase their general productive capacity.

It was stated that the corporation would operate on commercial principles. It was not intended to supplant private enterprise, but to supplement it—an assurance which was received with satisfaction in both Houses. Legislation would be introduced to establish the Colonial Development Corporation and to provide for the setting up of the corporation, which is to take over the groundnut project established in East Africa by the Minister of Food.

. . . . . .

Questions

Foot-and-Mouth Disease

Mr. Peter Freeman asked the Minister of Agriculture how many animals have been slaughtered because of foot-and-mouth disease; and what is the total amount of compensation that has been paid during the last twelve months.

Mr. T. Williams: The number of animals slaughtered during the year ended June 19th, 1947, because of outbreaks of foot-and-mouth disease was 12,744 and the compensation paid was £334,381.

. . . . . .

Soil Fertility (Inorganic Manures)

Mr. Rhys Davies asked the Minister of Agriculture to what extent, in view of the experience in parts of the U.S.A., researches are conducted in this country into the effects on soil fertility by the continued use of inorganic manure.

Mr. T. Williams: The continuous use of inorganic manures has been the subject of numerous experiments in this country, notably at the Rothamsted Experimental Station where heavy annual dressings of fertilizers alone have been applied for over a 100 years, and where high crop yields have been maintained and the soils are for the most part still in excellent condition. I am sending my hon. Friend a reprint of a paper dealing with the subject.

. . . . . .

Civil Servant (Political Controversy)

Sir E. Graham-Little asked the Minister of Agriculture if he will enquire into the case, details of which have been submitted to him, of a graduate of London University, a civil servant, who, as an honorary officer of a society for promoting the welfare of animals, pressed in public writings the society's objections to Clauses in the Agriculture Bill relating to the use of gin traps and was thereupon subjected to disciplinary action by his Department; and whether this method of silencing criticism is to be generally applied.

Mr. T. Williams: I am already fully aware of the details of this case. The essential facts are that a civil servant serving as a Senior Examiner in the Patent Office issued circulars to the public in his capacity as Chairman of the Universities Federation for Animal Welfare, urging the public to press their Members of Parliament to oppose certain provisions in the Agriculture Bill, to which the Federation objected on humanitarian grounds. He also issued an appeal to Members of this House to vote against these provisions. Civil servants are under standing instructions not to indulge in political controversy and to maintain a proper reticence in discussing public affairs. Though this must be largely a matter of judgment and good taste, it is clear that when a topic has become a matter of Parliamentary controversy, a civil servant should not take an active part in promoting support or opposition. The civil servant in question was informed by senior officials of his Department that in their opinion it was most undesirable for a serving civil servant to act as he had done.

Civil Servants (Professional Activities)

Sir T. Moore asked the Chancellor of the Exchequer to what extent permanent civil servants are permitted to take an active part in the work of professional bodies such as those which specialize in protecting and advancing the interests of professional men and women in the field of engineering, medicine, architecture, etc.; and what are the present rules on this subject.

Mr. Glenvil Hall: Civil servants are free to take part in the work of professional bodies, provided that their official work does not suffer and that they show a reasonable discretion.

NOTES AND NEWS

Diary of Events

July 9th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

July 11th.—Annual Meeting of the Society of Veterinary Practitioners, at the Holborn Restaurant, W.C.1, 2.30 p.m.

July 11th.—Annual Meeting of the Sussex Division, N.V.M.A. at Brighton (Old Ship Hotel), 2.30 p.m.

July 11th.—Meeting of the North Wales Division, N.V.M.A., at Bangor (School of Agriculture), 2 p.m.

July 18th.—Meeting of the Yorkshire Division, N.V.M.A., at Harrogate (Queen Hotel), 2 p.m., followed by Surgical Demonstrations at Starbeck Abattoir.

July 18th.—Annual General Meeting of the Lincolnshire and District Division, N.V.M.A., at "Highfield," Sleaford. 2.30 p.m.

July 22nd.—Meeting of the Southern Counties Division, N.V.M.A., at Brackendene, Burley, Nr. Ringwood, 2.30 p.m.

July 24th.—Meeting of the Royal Counties Division, N.V.M.A., at Marlborough, 10 a.m.

July 27th—Aug. 1st.—N.V.M.A. Annual Congress in Edinburgh.

July 31st.—12th Annual Meeting of the Royal (Dick) Veterinary College Alumnus Association, at the Royal British Hotel, Princes Street, 7 p.m.

July 31st.—Annual Meeting of the Association of Veterinary Teachers and Research Workers, at the Royal (Dick) Veterinary College, Edinburgh, 10.30 a.m.

* * * * *

Ministry of Agriculture—Veterinary Appointments

Further Resolutions in Support of Council

The following Resolution was passed at a meeting of the South-Eastern Division, N.V.M.A., held on June 25th, 1947:

"That this meeting of the South-Eastern Veterinary Association expresses unanimous support of the action of the Council, National Veterinary Medical Association, in urging upon the Ministry of Agriculture the immediate necessity of raising the salaries of their Veterinary Staff to a level in accordance with the status appropriate to a professional body."

. . . . .

The following Resolution was passed by the South Wales Division on June 24th, 1947:

"The South Wales Division affirms its full support of the Council, N.V.M.A., in its efforts to obtain improved status and salaries for the whole-time veterinary officers of the Ministry of Agriculture and Fisheries; it appreciates the special circumstances which have led to the decision to offer free advertisement space in *The Veterinary Record* for application for appointment, but it urges forcibly that every effort shall be made to secure a review of the imposed scales at the earliest moment."

The following letter appeared in *The Times* on Monday last:—

State Veterinary Service

To the Editor of The Times

Sir,—As all efforts made through the normal channels have failed to secure a remedy for the grievance under which the veterinary officers of the Ministry of Agriculture are labouring, we seek the hospitality of your columns in order to place a brief statement of the position before the public.

Long before the outbreak of the second world war the conditions of employment in the Government Veterinary Service were extremely unsatisfactory. In 1936 a deputation from the National Veterinary Medical Association was told that "salaries of the Ministry's staff had been under consideration for some years," and it was admitted that these salaries "were not proving attractive to the best recruits." Naturally, this information encouraged the association to believe that at length something was going to be done to raise the status of the professional officers of the Ministry concerned. A few months later came the announcement of the Ministry's intention to take over the veterinary staffs of local authorities. This centralization naturally involved a very considerable increase in the numbers of veterinary medical men in the whole-time or part-time employment of Whitehall; nevertheless, when the new salary scales were announced in October, 1937, they showed an average increase of only £20 per annum.

Thus the grievance remained substantially unaltered. War-time conditions made it impossible to secure improvements, but when hostilities ended the National Veterinary Medical Association again approached the Ministry of Agriculture in the hope of securing agreement on a scale of salaries which would attract to Government service men of the calibre required. That hope was not realized, and the post-war scale of salaries since decreed by the Minister is quite unacceptable to the profession.

It is no exaggeration to say that throughout the veterinary medical world there is a keen realization of the vital part which work on behalf of animal health must play in rebuilding our livestock industry as the sheet-anchor of agricultural prosperity. Leadership in any such campaign should come from the Animal Health Division in Whitehall—yet to-day the position of the professional men in the division has been described to us as being one of "disillusionment and discontentment," and we are satisfied that conditions of employment will remain unattractive to "the best recruits."

The Minister, we understand, will not budge from his decree unless his efforts to secure recruits prove altogether abortive. We submit that he would best serve the national interest and promote his agricultural policy by at once removing the long-standing grievance which we have defined.

We are, Sir, your obedient servants,

L. Guy Anderson, George N. Gould, William C. Miller, W. R. Wooldridge, Negotiating Committee, National Veterinary Medical Association of Great Britain and Ireland.

36, Gordon Square, W.C.1.

* * * * *

The Edinburgh Congress

As accommodation in Edinburgh is now very difficult to obtain, members still desirous of obtaining rooms for the Congress should get in touch immediately with the Honorary Local Secretary, Professor A. Robertson, Royal (Dick) Veterinary College, Edinburgh, 9.

* * * * *

CHARNOCK BRADLEY MEMORIAL FUND

Former pupils of the "Dick" College who are contemplating subscribing to the above and have not yet done so are asked to send their donations to the Honorary Secretary, Professor A. Robertson, Royal (Dick) Veterinary College, Edinburgh, 9, before July 26th in order that the total sum subscribed may be reported at the Annual Meeting during the Congress week.

* * * * *

PERSONAL

Birth.—Hodgins.—On May 20th, 1947, at Portobello House Nursing Home, Dublin, to Hazel, wife of R. Desmond Hodgins, M.R.C.V.S., Colonial Service, Northern Rhodesia—a son.

Tribute to Mr. George Elmes.—At a recent meeting of the St. Albans City Council, the Mayor, Mr. J. M. Donaldson, announced that Mr. George Elmes, F.R.C.V.S., the City Veterinary Inspector, now the senior officer in length of service of the Council, has decided to retire.

The Mayor said he was sure the Council would desire to thank Mr. Elmes for his 38 years' good service and wish him happiness in his retirement.

Mr. Elmes has been in practice in St. Albans for just over 50 years. He has also been Inspector for the Ministry of Agriculture for a considerable period, and has lectured at the Herts Institute of Agriculture, Oaklands, since its inception.

* * * * *

The Late Dr. Seymour Hadwen

In the issue of *Nature* of June 14th, the following account of the life and work of Dr. Seymour Hadwen is given by a veterinary contributor:—

Isaac Seymour André Hadwen, who died recently, was born at Lees, Lancashire, in 1877. He obtained the doctorate in veterinary science at McGill University in 1902, and it is of interest to note that he was a member of a small band that studied the subject at McGill. The Veterinary School there owed its development to a considerable extent to Sir William Osler at the time when he was at the McGill Medical School. The School had a very short life, however, and closed soon after Hadwen graduated. Thereafter veterinary education in Canada was maintained on a less ambitious plane for a good many years, until the course at the Ontario Veterinary College was expanded and its graduates were admitted to the doctorate of the University of Toronto.

Hadwen joined the Health of Animals Branch of the Dominion Department of Agriculture in 1904 and worked for a good many years at Ottawa, and also in British Columbia, on a variety of animal health problems important in Canada; for the latter part of that period he held the post of chief pathologist in that Department. In 1920 he left the Department as he felt that the research branch was not developing in the way he considered it should, and joined the United States Bureau of Biological Survey as chief veterinarian and parasitologist, Reindeer Investigation, in Alaska. From 1923 until 1929 he held the post of research professor of animal diseases in the University of Saskatchewan, and in 1929 became director of the Department of Veterinary Science, Ontario Research Foundation, from which he retired in 1942.

Hadwen was an outstanding man with a great deal of the pioneer in his character. He could study minutiae and did so constantly; but it was the wide range of biology that attracted him, the play of the environmental factors, and the struggle of animal life to maintain existence. Most of his personal work centred around parasitology, but many other subjects claimed his attention.

Early in his professional career, Hadwen was associated with the late Professor G. H. F. Nuttall in studies on the chemotherapy of piroplasmosis in dogs and cattle, in the course of which the fundamentally important discovery was made that trypan blue is specifically curative—a landmark in chemotherapy. He contributed largely to the literature of a problem still unsolved, namely, the causation of bovine chronic haematuria, a disease that is endemic in different countries. Ticks and the diseases with which they are associated interested him tremendously, and he had ample opportunity to study the problems concerned. His publications on "tick paralysis" as it occurs in Canada are still important; the disease has since been studied in Southern Europe, Africa and Australia, but its real nature has still to be demonstrated. He contributed work on the systematic classification of ticks and on their bionomics. Warble flies interested him greatly, and he made important observations on *Hypoderma bovis* and studied other members of the group. Helminth parasites, too, he understood well and studied continuously.

In his later work at the Ontario Research Foundation the subjects were those of importance to the Ontario Province. Much of it was done with Dr. R. Gwatkin and various colleagues, on bovine contagious abortion, mastitis and other problems of intensive husbandry very different from those to which he devoted most of his life.

Hadwen contributed important reports on reindeer; on the management of the herds, fertility in reindeer, their diseases and the manner in which reindeer meat in Alaska could be marketed on a large scale. He had travelled in Labrador and Lapland, studying the problems that had aroused his interests in Alaska. His work and publications indicated measures necessary for the maintenance of health of the herds and the need to change methods that had led, even in such a land of wide open spaces, to seasonal overcrowding with consequent parasitic infestation and ill-health. Wild animals had claimed his attention, and his writings include observations on snowshoe hares and on seals. In addition, he made expeditions to Labrador, and with the East Arctic Patrol to Ellesmere Island.

Hadwen was a member of several learned societies and had been elected an honorary member of the Section of Comparative Medicine, Royal Society of Medicine.

* * * * *

The Organization of Veterinary Affairs in Eastern Africa

[From Our Tanganyika Correspondent]

In our issue of May 17th we published a communication received from our correspondent in Kenya, Mr. R. N. Fiennes, on veterinary affairs in Kenya. We now have pleasure in supplementing this by the following letter:—

Veterinary Laboratory,
Mpwapwa.
May 20th, 1947.

The Editor,
The Veterinary Record,
Dear Sir,

Our colleagues at home in the United Kingdom will no doubt be interested to hear of the latest developments which have taken place in the organization of the veterinary profession in East Africa. For some years now, the veterinarians of Kenya, Tanganyika and Uganda have had Veterinary Associations affiliated to the parent body. These have been very active in recent years and have shown a healthy and virile interest in all affairs affecting the profession in the Colonies. It is gratifying to be able to report now, that the three divisions have amalgamated to form a branch of the N.V.M.A. to be called the Veterinary Association of Eastern Africa. The occasion of this amalgamation was one on which official conferences had brought delegates to Nairobi from Tanganyika, Uganda, and other African territories, *viz.*, N. Rhodesia, Nyasaland, Italian Somaliland, British Somaliland, Eritrea and the Sudan. The inaugural meetings were held in February at the Veterinary Research Laboratory at Kabete and much valuable work was done in laying down the constitution and policy of the branch.

The formation of this branch is of all the more importance coming as it does at a time when the parent body is fighting such a fine battle in the United Kingdom, and we in the Colonies are making great strides in development and the elevation of our professional status.

I am sure I am speaking for the delegates from all the other territories when I express thanks publicly to the Kenya Veterinary Association for the magnificent hospitality which they extended to us all and for the most satisfactory meetings we had and contacts we made and renewed.

A letter on this subject would be far from complete if it did not include at least a brief account of the social side of our Kenya colleagues' entertainment. A dinner dance at Torr's Hotel in Nairobi was arranged and it is a happy augury that this was described as "The First Annual Dinner of the Kenya Veterinary Association." The organization was excellent and Dr. H. S. Purchase, the President of the K.V.A., and his many helpers, of whom Dr. S. E. Piercy, Mr. Bob Hammond and Mr. P. Ford deserve special mention, are to be congratulated on excellent work. Nor, of course, should the ladies be forgotten, Mrs. Purchase and Mrs. Beaumont and Mrs. Hammond putting in so much work which added to the success of the occasion. The guest of honour was the Hon. Major Cavendish Bentinck, Member for Agriculture, Kenya, whose speech left no doubt as to his friendly feelings towards the profession, of whom 44 members were present.

It is my pleasure also to report that during this great week Mr. Oswald, Messrs. May & Baker representative in E.A., and his colleague, Mr. Paisley, on a tour of Africa, entertained members of the Veterinary Association of Eastern Africa to a dinner at the New Stanley Hotel. This was a very happy occasion and emphasized the pleasant relations between the manufacturers on the one hand and the profession on the other.

We in E.A. intend to spare no effort to see the profession accorded its full and rightful recognition in the Colonies and we send to you at home our best wishes for success in your fight for similar rights.

Yours faithfully,
Jack K. H. Wilde.

* * * * *

DRIED EGG AND SALMONELLA

Messrs. R. F. Gordon and A. Buxton, of Weybridge, make the following contribution to correspondence on the above subject currently appearing in the *British Medical Journal*:—

"In the leading article, 'The Egg as Poison' (April 5th, p. 456),

reference is made to the isolation by Gordon and Buxton[1,2] of *Salm. typhi-murium* from ducks and *Salm. thompson* from chickens. We would point out that in addition to these two salmonella types and to *Salm. pullorum*, *Salm. gallinarum*, and *Salm. enteritidis*, the following have also been recorded[3]: *Salm. california*, *Salm. bareilly*, *Salm. montevideo*, *Salm. anatum*, and *Salm london*. Recently, we have also isolated *Salm. bovis morbificans* from a serious outbreak of disease in chicks. There is little doubt that the presence of these latter types is associated with the importation into this country of American spray-dried egg, which is known to have been fed to poultry either directly or indirectly in canteen or camp swill. The incidence of these salmonella types in poultry is very similar to that recorded[3] in man and pigs during the same period, and an increase of over 200 per cent. in the incidence of avian salmonellosis was reported[4] during the years 1941-44.

"Unlike *Salm. pullorum* these other salmonella types do not usually infect the ovary of the adult bird, and in a study of the pathogenesis of *Salm. thompson* (in press) it has been shown that the infection of egg meat generally occurs only when conditions of egg storage are suitable to allow the penetration of the organism through the egg shell. It is probable, therefore, that the danger to public health from the consumption of clean chicken eggs is almost negligible."

References

1 *Mon. Bull. Emerg. Publ. Hlth. Lab. Serv.* (1945.) **4.** 46.
2 *J. Hyg., Camb.* (1945.) **44.** 179.
3 *Med. Res. Cncl. Rep.* (1947.) No. 260. London.
4 *Vet. J.* (1946) **102.** 187.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Foot-and-Mouth Disease:

Glamorgan.—Amwylysyrn, St. Nicholas, Glamorgan (June 28th).
Hampshire.—Sturlings Farm, Fareham, Hampshire (June 28th).

* * * * *

The Veterinary Educational Trust has received a donation of £30 from the canine section of Timperley (Cheshire) Agricultural Society and £5 5s. from Ashton-under-Lyne Kennel Association. These gifts are earmarked for aid to the Canine Research Station of the Trust.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents should write as briefly as possible and letters should not exceed 350 words.

NEWCASTLE DISEASE

Sir,—My attention has been drawn to the current correspondence on Newcastle disease, ending with Sir Frank Ware's letter in your issue of June 14th. A full summary of the work done at Muktesar during the war, including the origin of the "Indian" vaccine, has now appeared in print—*Ind. J. vet. Sci.* **16**, pt. II, 45 (June 1946)—and it seems unnecessary, therefore, for me to enlarge on the points raised.

Yours faithfully,

Research Station, Pirbright, Surrey. J. R. Haddow.
June 24th, 1947.

* * * * *

NEED FOR A PROFESSIONAL STANDARD FOR CANINE NURSES

Sir,—This is an appeal from a human nurse (and soi-disant canine nurse) to the veterinary authorities in this country to lead the world in setting a professional standard for canine nurses.

At present, as is well known, anyone—whether she has ever handled a sick dog in her life or not—can call herself a canine nurse; and even though she has had a considerable nursing experience, her methods may be, and very often are, entirely out of date, unscientific, and even unhygienic. There is no remedy, and people are obliged to employ such nurses for lack of anyone else.

This has two glaring disadvantages. One is obvious—the trouble caused to the patients, the veterinary surgeon, and the owners.

The second is less obvious—the danger to the dog world when these ignorant and untrained kennelmaids or kennelmen pose as experts and do all sorts of treatments for poor people, who are influenced by their sympathetic manners and assumption of great experience. How often have I heard the remark: "I'd rather have Miss So-and-So than any vet."!

In the big kennelmaids' training schools, we teach the students the sharp line between their proper sphere, and that of the veterinary surgeon, and it is instilled into them that they are not to be little quacks. Unfortunately there are more untrained than trained kennelmaids.

A person like myself, with a real vocation for canine nursing, may work for years under veterinary surgeons, and in the (pre-war) recognized distemper homes, but at the end we have no professional status.

As this would be an interesting and much needed new career for women, and as the creation of the Veterinary Educational Trust and the keen interest in the development of veterinary research is focusing interest on this subject and adding to the demand for properly trained women, this seems a suitable moment to deal with the matter.

Would it not be possible to accept nursing students at the Royal Veterinary College, or failing that at recognized veterinary establishments, where surgical, medical and maternity courses could be taken?

The matter really is urgent. The horrors of human "nursing" in Florence Nightingale's day are certainly no worse than much "canine nursing" that goes on to-day.

We cannot, I suppose, expect to win our case at once, considering the opposition to the training of nurses in the old days, but I do most urgently and earnestly appeal for the consideration and ventilation of this subject—which I personally know is warmly supported by many modern veterinary surgeons.

Yours faithfully,

Bellmead Kennels, Nadyne Joergens (Miss).
Haslemere, Surrey.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
May 16th to 31st, 1947	5	—	128	—	3	—
Corresponding period in—						
1946	3	1	—	—	—	14
1945	4	1	—	—	—	34
1944	8	2	—	1	1	59
Jan. 1st to May 31st, '47	39	83	333	1	22	14
Corresponding period in—						
1946	47	24	—	4	34	252
1945	48	77	—	5	37	452
1944	102	21	—	6	59	325

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at May 31st, 1947, was as follows:—

England	Wales	Scotland	Total (Great Britain)
7,913	10,548	8,866	27,327

EDINBURGH CONGRESS, 1947

The following is the Programme of the Association's Congress to be held at the Royal (Dick) Veterinary College, Summerhall Square, Edinburgh, 9, from July 27th to August 1st (inclusive), except where otherwise stated.

SUNDAY, JULY 27TH

7.30 p.m. to 9.30 p.m.	Reception by Scottish Metropolitan Division in Royal (Dick) Veterinary College.

MONDAY, JULY 28TH

10.30 a.m.	Opening of Congress by the Deputy to the Lord Provost of Edinburgh, Bailie Bruce Turnbull.
11 a.m.	Opening of Exhibition of Drugs and Surgical Instruments, etc., by President, N.V.M.A.
11.30 a.m.	Council Meeting.
12 Noon	Demonstrations.
2 p.m.	Paper: "Toxicological Problems in Veterinary Practice." By G. F. Boddie, B.Sc., M.R.C.V.S., F.R.S.E. Openers of discussion: H. H. Green, D.Sc., and T. M. Mitchell, M.R.C.V.S., D.V.S.M. Chairman: J. N. Ritchie, B.Sc., M.R.C.V.S., D.V.S.M. Recording Secretary: J. S. S. Inglis, B.Sc., M.R.C.V.S
2 p.m.	Ladies' Outing to Zoological Gardens.
8 p.m. to 1 a.m. ..	President's Reception and Dance (Freemasons' Hall, 96, George Street, Edinburgh, 2).

TUESDAY, JULY 29TH

9.30 a.m.	Paper: "Retention of the Placenta in the Bovine." By A. J. Kennedy, B.Sc., M.R.C.V.S. Openers of discussion: A. S. Chapman, M.R.C.V.S., and J. M. Rorrison, M.R.C.V.S. Chairman: R. W. Johnston, M.R.C.V.S. Recording Secretary: A. Thomson, M.R.C.V.S.
11 a.m.	V.V.B.F. Ladies' Guild Annual General Meeting.
2 p.m.	Visit to Laboratories of the Animal Diseases Research Association, Moredun Institute, Gilmerton, or to Corporation Markets and Slaughter-house, Gorgie, Edinburgh.
7.30 p.m.	Civic Reception by the Corporation of the City of Edinburgh. (City Chambers, High Street, Edinburgh.)

WEDNESDAY, JULY 30TH

9.30 a.m.	Paper: "The Immunology and Epidemiology of Virus Diseases." By M. Crawford, M.R.C.V.S. Openers of discussion: W. M. Henderson, D.Sc., M.R.C.V.S., and D. R. Wilson, D.Sc., M.R.C.V.S., D.V.S.M., F.R.S.E. Chairman: D. C. Matheson, M.R.C.V.S., D.V.S.M., F.R.S.E. Recording Secretary: J. W. Emslie, B.Sc., M.R.C.V.S.
10 a.m.	Ladies' Golf Tournament at Liberton Golf Course.
1.45 p.m.	Congress Photograph.
2.30 p.m.	Ladies' Outing to Lauriston Castle.
2.30 p.m.	Annual General Meeting.
3.30 p.m.	Surgical Operations by Professor J. G. Wright, M.V.S., F.R.C.V.S., Liverpool.
7.30 p.m. for 8 p.m...	Annual Dinner in Freemasons' Hall.

THURSDAY, JULY 31ST

9.30 a.m.	All-day Excursion to Trossachs.
10 a.m.	Demonstrations.
10 a.m.	All-day Excursion to Borders.
10 a.m.	Men's Golf Tournament at Luffness Golf Course.
10.30 a.m.	Annual General Meeting of the Association of Veterinary Teachers and Research Workers.
2.30 p.m.	Films (Freemasons Hall).
8.30 p.m. to 1 a.m. ..	Ladies' Veterinary Benevolent Guild Dance.

FRIDAY, AUGUST 1ST

10 a.m.	Closing Meeting.
11 a.m.	Council Meeting.
2 p.m.	Conducted Tour of Royal Mile, Edinburgh.